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IMPACT OF INSTITUTIONAL QUALITY, FINANCIAL INCLUSION, AND INFORMATION COMMUNICATION TECHNOLOGY ON ECONOMIC GROWTH: EVIDENCE FROM SELECTED ASIAN COUNTRIES

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ABSTRACT

The existing research makes an effort to check the impact of institutional quality, financial inclusion, and information communication technology on economic growth in eight Asian countries. The sample countries include Bangladesh, India, Indonesia, Iran, Jordan, Malaysia, Pakistan and Philippines. Analysis is done through sysGMM panel estimator on the data from 2012 to 2022. The study has taken GDP per capita as dependent variable and institutional quality, financial inclusion, and information communication technology are used as independent variables. SysGMM results revealed that institutional quality, financial inclusion, and information communication technology are positively related with the economic growth of the selected eight Asian economies. Implication of this research is improvement and development in institutional quality, financial inclusion and information communication technology is of profound importance in economic growth.

KEYWORDS: institutional quality, financial inclusion, information communication technology, economic growth

1. INTRODUCTION

Since financial inclusion has been contributing a lot to social development, it is predominantly essential to get a way to make improvements in financial inclusion. Past studies documented that information technology is playing a major role in this regard. It is true that developed general information technology has led to internet and mobile phones popular, making financial services break through, and mainly decreasing cost of financial services (Ofori, Osei & Alagidede, 2022). In viewpoint of banks, information technology has improved the competence and stability of banking operations. It increases market capacity by making better financial innovation, thereby refining the efficiency of commercial banks in delivering loans and engrossing savings (Marinc, 2013).

Development of any state necessitates its financial sector to be much improved and advanced. And the financial sector's development ensues the procedure of establishment and growth of institutions, instruments and markets that endure the enormous investment levels and growth which may reduce poverty. Therefore, financial development provides efficient data about essential profitable investments and indorses the best distribution of capital. In other words, the appearance of financial institutions assists in restraining the cost of obtaining information and efficiently apparatuses contracts and performs dealings. Likewise, the growing financial access instructs dynamic efficacy in the system by conveying about an organizational variation with the help of innovation and welfare improvement to the whole economy.

Additional, in line with Levine (1997), financial systems supports in trading, modification, hedging and risk improvement, separately from easing communications of commodities and services. Also, capital accumulation and technological innovation are the equipment of financial development and growth. The distribution of credit by financial system performs as a channel of financial and real sectors, which can be utilized to finance employed capital rations and investment in fixed capital (Das & Guha-Khasnobis, 2008).

Institutional quality plays a crucial role in driving economic growth. Strong institutions provide a stable and predictable environment that fosters economic activity and attracts both domestic and foreign investment. Epko (2020) suggested that when institutions ensure the protection of property rights, businesses and individuals are more inclined to engage in productive activities, as they have the confidence that their efforts and investments will be safeguarded. Nguyen, Su, & Nguyen, (2018) also suggested that institutional quality contributes to the efficient functioning of markets and reduces transaction costs. Well-functioning legal systems, regulatory frameworks, and effective governance mechanisms help establish trust between economic agents, encouraging trade and investment. This leads to increased market efficiency, improved allocation of resources and enhances productivity, all of which are essential for economic growth.

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The study of past literature demands a study that sheds light on the influence of institutional quality, financial inclusion, and information communication technology in the economic growth. This study attempts to fill this gap and contributes to the existing literature through the comprehensive analysis of independent variables in eight Asian countries. The institutional quality index is calculated using voice and accountability, political stability and absence of violence, government effectiveness, control of corruption, rule of law and regulatory quality indicators. Financial inclusion index is measured through number of commercial bank branches per 100,000 adults, number of ATM per 100,000 adults, outstanding loans, and outstanding deposits of commercial banks. Information communication technology index is calculated through fixed telephone subscription per 100 people and mobile cellular telephone users per 100 people. The study found strong positive impact of institutional quality, financial inclusion, and information communication technology on economic growth of the 8 selected Asian economies.
The study is organized into total five sections. Section II shows review of literature. Section III shows data and methodology. Section IV provides results and discussion. And section V gives the conclusion.

2. LITERATURE REVIEW

This section provides an overview of the past studies that have focused on the economic growth. These studies have found various determinants of the economic growth and are discussed in the following part of this section.
Omar & Inaba (2020) suggested that bad economic performance, inequality, low standard of living, and poverty has been related to the poor financial inclusion in under-developed nations, with negative implications on economic growth. In their study to find the impact of financial inclusion and information communication technology on the economic growth, Mihasonirina & Kangni (2011) found that financial inclusion and information communication technology has a profound impact on the economic growth.
In their endeavour to find the impact of financial development on the economic growth, Adusei (2013) analysed the data of 24 selected African countries over the period of 1981-2010. Using dynamic GMM model they found a positive relationship between financial development and economic growth. Further, using pairwise granger causality testing, they also found the evidence of bidirectional causality between financial development and economic growth. Kpodar & Andrianaivo (2011) analyzed the impact of information and communication technologies and financial inclusion on the economic growth of African economies during 1988 to 2007. They have used mobile phone rollout as a proxy for information and communication and number of deposits per head as a proxy for financial inclusion. They used GMM technique to analyze the data. Their study revealed a strong positive impact of information and communication technology and financial inclusion on the economic growth of Arican countries.
Lenka & Sharma (2017) showed that financial inclusion has provided various beneficial financial services to the general public for improving their lifestyle. They examined the influence of financial inclusion on economic growth in India using the data 1980 to 2014. A positive link of financial inclusion and growth was found out in India. The authors also suggested the improvement in efficiency of financial institutions for further enhancement economic growth. Thomas, Bhasi, & Chandramouli (2017) examined that how financial accessibility affects the economic growth in eight South Asian states. The data was analysed from 2007 to 2015. The GMM results showed that increased financial accessibility results in increased income and growth.
Ajide (2017) and Epko (2020) argued that lack of access to financial resources, government failure, institutional inequality are major factors for a dissatisfactory economic performance. This suggests that strong institutions and governance are insufficient for sustainable growth without financial inclusion. Shchegolev & Hayat (2018) found that government adequacy, corruption control, quality regulations and rule of law splay substantial role in gross domestic product (GDP) increase.
The role of institutional quality on the growth of economy is also heavily debated in the literature. Nguyen, Su, & Nguyen, (2018) investigated the relationship between institutional quality and economic growth for 29 emerging economies. Their data spans over a period of 2002-2015. They employed the system generalized method of moment (SGMM) to analyse the data. Findings of their study revealed that institutional quality has a significant positive impact on the economic growth. Grabowski & Self (2020) documented the policies that aimed to improvement in governance and institutional quality lead to increased economic growth. Adegboye (2020) found that institutional quality has a positive impact on the inflow of the foreign direct investment (FDI) that has a strong positive influence on labour productivity and these both the important factors for the growth of economy.
Inoue & Hamori (2019) also found that financial inclusion is an important determinant of economic growth. They examined the data from 2004 to 2014 and used GMM method. Their findings revealed that financial inclusion, that is, improved access to formal financial services led to increase growth. Further their findings suggested that number of commercial bank branches and real per capita GDP are positively related. With similar findings, Van and Linh (2019) documented that financial inclusion results in increased economic growth in selected Asian countries.
Chatterjee (2020) focused on impact of financial inclusion and ICT on economic growth in forty-one states. The data was collected from 2004 to 2015. Result showed that financial inclusion backed by improved ICT penetration results in high economic growth in developing nations. Dahiya and Kumar (2020) also analysed that how financial

inclusion in emerging Indian economy, impacts growth. Through analysing the data from 2005 to 2017 they found a positive link between financial inclusion and economic growth. Using a GMM technique, Ali, Nazir, Hashmi, & Ullah, (2022) also showed that institutional quality and financial inclusion enhances economic growth.

In a study of forty-three states, Kouladum, Wirajing, & Nchofoung (2022) examined the impact of digital technology on financial inclusion by using data from 2004 to 2019. The GMM results showed that ICT indicators have increased financial inclusion in Sub Saharan Africa. The study suggested for higher investments in promoting financial and technological infrastructures and human capital.

All of the past studies discussed in the section provide evidence of positive association between institutional quality, financial inclusion and information communication technology and economic growth. Therefore, this study draws following directional hypotheses.

The hypotheses of this study are given as follows:

H1: There is a positive association between institutional quality and economic growth.

H2: Financial inclusion is positively linked with the economic growth.

H3: Information communication technology has a positive relation with economic growth.

3. DATA AND METHODOLOGY

3.1. DATA SOURCES

In this study, we employed a sample of 8 countries - Bangladesh, India, Indonesia, Iran, Jordan, Malaysia, Pakistan, and Philippines. The time period of this study is from 2012-2022, it covers the fluctuations in the GDP of the selected countries. Data was collected from World Governance Indicators (WGI), World Development Indicators (WDI), Financial Access Survey (FAS) and International Monetary Fund (IMF).

The dependent variable is GDP per capita (in $US). The Principal Component Analysis (PCA) is used to generate a single composite index for institutional quality, financial inclusion, and information communication technology for all the 8 countries. PCA is a data reduction method and the composite index is based on the correlation of the individual measures of institutional quality (voice and accountability, political stability and absence of violence, government effectiveness, control of corruption, rule of law and regulatory quality), financial inclusion (number of commercial bank branches per 100,000 adults, number of ATM per 100,000 adults, outstanding loans and outstanding deposits of commercial banks) and information communication technology (fixed telephone subscription per 100 people and mobile cellular telephone users per 100 people).

4. METHODOLOGY

To explore the relationship between institutional quality, financial inclusion and information communication technology with the economic growth SysGMM estimator is used. GMM estimators are superior to panel data estimators in the case of growth models. Blendell & Bond (1998) suggested that sysGMM estimators account for country-specific and time effects and also address the endogeneity problem with the use of appropriate lags of the regressors using appropriate lags.

The econometric model is as follows:

$$GDP_{it} = \beta_0 + \beta_1 GDP_{i,t-1} + \beta_2 IQX_{it} + \beta_3 FIX_{it} + \beta_4 ICTX_{it} + \beta_5 INF_{it} + \beta_6 UER_{it} + \beta_7 LR_{it} + \mu_{it} + w_{it}$$

Where, GDP represents economic growth, $GDP_{i,t-1}$ denotes the dynamic component of the relationship. IQX is institutional quality index and covers institutional quality indicators. FIX is financial inclusion index and covers financial inclusion indicators and ICTX is information communication technology index and covers ICT indicators. INF, UER and LP are control variables and represent inflation rate, unemployment rate and literacy rate respectively.

5. RESULTS AND EMPIRICAL ANALYSIS

At first the stationarity of variables in checked through panel unit root test analysis. Then the two step sysGMM estimators are obtained to analyse the data.

Table 1: Panel Unit Root Test

Variables	LLC	I(d)	IPS	I(d)
GDP	-6.45982***	I(1)	-5.87466***	I(1)
IQX	-5.48787***	I(1)	-5.95458***	I(1)
FIX	-3.45684***	I(1)	-3.25446***	I(1)
ICTX	-3.25465***	I(1)	-2.59741***	I(1)
INF	-6.82154***	I(1)	-5.451923***	I(1)
UER	-4.58746***	I(1)	-4.02545***	I(1)
LR	-5.41258***	I(1)	-3.45817***	I(1)

***,**,*denote significance at 1%, 5%, and 10% respectively.

Table 1 reports the results of panel nit root test. The results of the unit root test show that all the variables are of first order integration.

Table 2 depicts the results of the panel data regression model. For this data is checked for the normality by standardized residual, Durbin-Watson and White tests. As the result of Hausman-test was found insignificant, therefore random-effect panel data regression is done on the data.

Table 2 show that one unit increase in previous year LGDPPC will result in increase in current GDP growth by 0.8848 unit. Financial inclusion is found to be a key factor in determining economic growth of Asian economies. Table 1 shows that one unit increase in NCOMB leads to increased economic growth by 0.0027 unit. The result also shows that one unit increase in NUATM results in 0.0026 unit increased economic growth of Asian economies. Also, one unit increase in outstanding loans from commercial banks has enhanced growth by 0.0006 unit.

Table 2: 2-Step System GMM Results
(Dependent Variable is GDP)

Variables	Symbols	Coefficients and t-statistics	Hypothesis Test
Lagged GDP	$GDP_{i,t-i}$	0.8848 ** (0.0467)	---
Institutional Quality Index	IQX	0.0016 ** (0.102)	Alternate hypothesis accepted
Financial Inclusion Index	FIX	0.0025 *** (0.0268)	Alternate hypothesis accepted
Information Communication Technology Index	ICTX	0.0001** (0.000)	Alternate hypothesis accepted
Inflation Rate	INF	0.0001* (0.035)	---
Unemployment Rate	UER	0.0160 (0.0238)	---
Literacy rate	LT	0.0021 0.0005	---
N		104	
Groups		8	
AR(1)		-1.07	
AR(2)		-0.24	
Sargan Test		28.45	
Hansen Test		6.13	

The above table reports the results of 2-step System GMM. t-statistics are reported after the coefficients in parentheses. p-values are reported for AR(2) and the Hasnen statistic. ***,**,* denote significance at 1%, 5%, and 10% levels, respectively.

Table 2 reports the rerult of 2-step System GMM estimators. Institutional quality is significantly related with the economic growth. The results show that institutional quality has a positive association with the economic growth. Here we accepted our first hypothesis. This finding is in conformity with the Nguyen, et al. (2018), Shchegolev & Hayat (2018) and Grabowski & self (2020). This finding suggests that accountability, political stability and absence of violence, government effectiveness, control of corruption, rule of law and regulatory quality are the key factors to economic growth. Countries lacking in these qualities may suffer in terms of economic growth.

Financial inclusion is found to have a significant positive relationship with the economic growth. Here we accepted our second hypothesis that states that financial inclusion is positively linked with the economic growth. This finding suggests that access to formal financial products leads to rise in credits and propensity to undertake savings and investments, which increases economic activities and thus promotes economic growth. This finding is similar to the findings of Van & Lin (2019), Inoue & Hamori (2019) and Omar & Inaba (2020).

Information communication technology index is also found to promote economic growth in selected Asian economies. We accepted out third hypothesis that stated that Information communication technology has a positive relation with economic growth. This finding suggests that by using internet, mobile phones, people may easily approach financial services and make use of them to enhance investment, production, and earnings. And this increases the economic growth. The study result is similar to the finding of Kouldum, et al. (2022).

6. CONCLUSION

This research sought to find the relationship between institutional quality, financial inclusion, and information communication technology and economic growth in 8 Asian countries from 2012-2022. The selected countries

are Bangladesh, India, Indonesia, Iran, Jordan, Malaysia, Pakistan, and Philippines. The Principal Component Analysis (PCA) is used to generate a single composite index for institutional quality, financial inclusion, and information communication technology for all the 8 countries**.** Institutional quality index is measured through voice and accountability, political stability and absence of violence, government effectiveness, control of corruption, rule of law and regulatory quality. Financial inclusion index is measured through number of commercial bank branches, number of ATM machines, outstanding loans, and deposits from commercial banks. Moreover, information communication technology index is calculated through fixed telephone subscription per 100 people and mobile cellular telephone users per 100 people.

The panel data is analysed through sysGMM model. Institutional quality, financial inclusion and information communication technology are found to have positive impact on the economic growth. To get the benefit of these finding policy makers of these 8 countries are suggested to formulate programmes and policies that promote access of economic agents to the financial services and strengthen financial institutions. This will reduce uncertainties and engender confidence among public and thus generate economic growth. Governmental efforts are also needed to focus on governance and quality of institutions and promotion of information communication technology as critical conditions for sustainable growth and viable development.

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